987,996

PATENT SPECIFICATION

DRAWINGS ATTACHED

987,996

Date of Application and filing Complete Specification: Jan. 1, 1962.
No. 67/62.
Application made in France (No. 849,388) on Jan. 11, 1961.
Application made in France (No. 879,023) on Nov. 15, 1961.
Complete Specification Published: March 31, 1965.

Index at acceptance:—B7 J (68B2, 68C, 68J)
Int. Cl.:—B 62 d

COMPLETE SPECIFICATION

Improvements in or relating to Bumpers for Road Vehicles

We, REGIE NATIONALE DES USINES RENAULT, a French Body Corporate, of 8/10, Avenue Emile Zola, Billancourt (Seine) France, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to road vehicles having bumpers of the kind having component elements which can be tilted down in order to facilitate access to the interior of the vehicle body.

Designers of modern vehicles having low floors have been led, with a view either to protecting the coachwork or body against shocks from bumpers of other vehicles or to comply with legal requirements, to position the bumpers above the floor level of the vehicle. This is particularly so in the case of commercial transport or delivery vans or trucks.

This arrangement is inconvenient, particularly when it is desired to have easy access to the floor level of the vehicle. The bumper then constitutes an obstacle both to the passage of the various articles to be loaded and to the operation of the doors or lid closing the loading aperture.

According to the invention, there is provided a road vehicle having a bumper device comprising laterally mounted horizontal pivot means secured to the vehicle frame below the floor level of the vehicle, bumper bar support means, pivoted to said pivot means for vertical arcuate movement between a raised position and a lowered position, a bumper bar secured to said support means and resilient means disposed between the vehicle frame and the support means and arranged with respect to the said pivot means so as to urge said support means and bumper bar by overcentre action into one or other of the said positions.

The invention will now be described by way of example with reference to the accompanying drawings in which:—

[1 .]

Figure 1 is a fragmentary elevational view showing the mounting of a bumper according to the invention as seen from the rear of the vehicle,

Figure 2 is a side elevational and part-sectional view of the bumper of Figure 1,

Figure 3 is a plan view from above of the bumper of Figure 1,

Figure 4 and Figure 5 are sections taken upon the lines IV and V respectively of Figure 2,

Figure 6 is a part-elevational view of a second bumper according to the invention in the raised position, as seen from the rear of the vehicle,

Figure 7 is a fragmentary plan view from above of the bumper shown in Figure 6,

Figure 8 is a cross-sectional view as seen from the left-hand side of the bumper shown in Figure 6,

Figures 9, 10, 11, 12 and 13 are respectively detail views or sectional views taken upon the lines IX, X, XI, XII and XIII of Figure 8.

Referring first to Figures 1 to 5 of the drawings, the bumper comprises two horizontal parallel elements or bars, that is a fixed lower element 1 and a folding upper element 2.

The lower element 1 is secured on the chassis frame 3 or to the understructure of the body of the vehicle by a number of substantially L-shaped angle section members 4, Figure 2 to which the element 1 is welded. Lateral flexure of the lower element 1 in relation to the frame or understructure of the vehicle is prevented by a number of triangular gusset plates 8 welded between the L-shaped members 4 and the element 1. In the corner of each member 4, a hole 5 is formed for receiving a pivot or hinge pin 6. The pivot or hinge pin 6 carries a U-section support member 7 (Figure 2) to which the upper element 2 is secured and which also constitutes an overrider. In addition, the angle members 4 are provided with rubber pads 9 for a purpose to be defined presently.

The movable element 2 of the bumper is

rigidly assembled with the support member 7 by means of a support 10 on which they are both bolted or welded. A pair of crescent-shaped shoes 11 of Nylon or other suitable material having a low co-efficient of friction are secured on the upper bumper element 2. The shoes 11 are disposed symmetrically in relation to the longitudinal centre line of the vehicle, and in the same vertical planes as those of another pair of elongated shoes 12 of same material which are secured on the lower door or lid 13 of the vehicle. A traction spring 14 has one end secured at 15 to the support member 4 and the other end anchored at 16 on the member 7. A rubber pad 17 is secured on a support 18 bolted on the vehicle body at 20 so as to prevent vibration of the bumper when in the raised position.

This device operates as follows:—

In the raised position, (the door 13 being closed) the upper movable element 2 of the bumper is in the position shown in thick lines in Figure 2. The spring 14 urges the movable bumper bar 2 against the upper rubber pad 17 and the member 7 against the lower pad 9.

When the door 13 is opened by tilting about its hinge pins in the direction of the arrow 19, the elongated Nylon shoes 12 engage the crescent-shaped shoes 11 of element 2 and slide thereon so as to cause the members 7 and therefore the movable element 2 to tilt backwards about the pivot pins 6 in the direction of the arrow 19. When the element 2 has moved arcuately to a position beyond the position of maximum extension of the traction springs 14, the members 7 are drawn downward to position 2^{11} in which they are kept by the overcentre toggle action of said springs, the straps abutting against the lower portion of supports 4. Free access to the floor 21 may then be had. If desired the door 13 may also be disengaged from its hinges and removed from the vehicle to facilitate the loading or unloading of the latter.

To restore the assembly to its normal condition, the operator tilts the movable element 2 of the bumper to its upper position into which it is similarly urged by the toggle action of the springs 14, after having refitted or reclosed the door 13.

In the alternative embodiment of the invention which is illustrated in Figures 6 to 13 of the drawings the bumper is also mounted at the back of the vehicle having a floor 21 and a door 22 hingedly mounted on the vehicle body by means of pins 23.

This bumper comprises two tubular bars 25 and 26 extending horizontally in planes ensuring a suitable protection of the back of the vehicle, these bars being secured on a pair of L-shaped members 24 of which only one is visble in the drawings.

The bars 25 and 26 are secured on an arm 24^1 of each L-shaped member 24, another fork-shaped arm 24^2 of the member 24 extending under the floor of the vehicle where it is pivotally mounted adjacent to its end. This pivotal mounting consists of a box girder formed from two channel girders 27 and 28 and spaced by a tubular distance-piece 29 which receives in its bore the pivot pin 30.

The pivot pin 30 consists preferably of a bolt which passes through holes in the fork constituted by the arm 24^2, suitable washers 31 being disposed at either ends of the distance-piece.

Each box girder 27/28 is secured by bolts 32 on a longitudinal member 33 of the vehicle under-frame or under-structure (see Figures 8 and 10). Also secured on the box girder is a lug 34 for anchoring one end of a traction spring 35 the other end of which is attached to a hole 36 formed in the arm 24^2 of the L-shaped member 24 which is suitably reinforced at this location. The spring 35 is effective to urge the bumper into the raised position when the member 24 is above the position at which maximum extension of the spring 24 takes place.

There is provided on either side of the vehicle (see Figure 7), for engagement by the upper bar 25, a shock-absorber pad 38 of resilient material having a support 39. The support 39 is in turn bolted on a fixed member 40 disposed internally of the body through which the support 39 extends. A suitable rubber bushing 41 is interposed between the support 39 and the body as shown.

Wedge members 42 are secured on the upper bar 25 so as to co-operate one with each shock-absorber pad 38, the wedge members 42 being positioned with so as to frictionally engage with the inner side faces of pads 38 along planes converging toward the longitudinal centre line of the vehicle and assist in maintaining the bumper in the raised position. The upper bar 25 also carries pads 43 adapted to engage with corresponding elongated pads 44 secured on the door 22 so that when the latter is folded down in the direction of the arrow O (Figure 8) the simultaneous lowering of the bumper is effected by sliding contact.

However, outside this specific application in the case of a door having horizontal hinges (which may be detachable if desired), the bumper illustrated in Figures 6 to 13 can also be tilted down to a position in which the back of the vehicle is completely clear at floor level, the bumper being maintained in this position by the traction springs 35. This position is illustrated in chain-dotted lines in Figure 8, wherein the U-sectioned L-shaped member 24 has disposed between the prongs of the fork arm 24^2, a lug 24^3 so shaped and positioned as to engage the resilient pad 45 secured under the mounting support. The point of anchorage of each spring 35 on each arm 24^2 is so positioned that when the lug 24^3 is engaged with the pad 45, the line of

action the spring 35 passes through or below the axis of the pivot pin 30 so that the action of the spring is nullified or tends to draw the L-shaped member 24 under the vehicle.

The L-shaped members may be provided on their outer faces with resilient overriders 46.

Figures 12 and 13 illustrate the mounting of bars 25, 26 and the overriders 46 on the angle supports 24. The bars 25, 26 are secured respectively on each L-shaped member 24 by means of a bolt 47 with the interposition of a bearing member 48 through which said bolt extends, the bolt head being assembled with a distance-piece 49 secured between the wings or flanges of arm 24^1.

Moreover, each overrider has embedded therein a metal reinforcement 50 carrying, at two spaced points of the overrider, a bolt shank 51 to permit a direct mounting on the support 24. Alternatively the resilient overriders may be secured on the supports 24 by an adhesive.

Bumpers as described may alternatively be mounted on other parts of the vehicle, for example on the front end of the vehicle so as to facilitate access to the engine compartment.

WHAT WE CLAIM IS:—

1. A road vehicle having a bumper device comprising laterally mounted horizontal pivot means secured to the vehicle frame below the floor level of the vehicle, bumper bar support means pivoted to said pivot means for vertical arcuate movement between a raised position and a lowered position, a bumper bar secured to said support means, and resilient means disposed between the vehicle frame and the support means and arranged with respect to the said pivot means so as to urge said support means and bumper bar by overcentre action into one or other of the said positions.

2. A road vehicle according to Claim 1, wherein an access is provided having a closure member pivoted substantially at floor level for downward arcuate opening movement, which closure member has first shoe means secured thereon for sliding engagement with second shoe means secured on the bumper bar whereby lowering of the closure member causes the support means and bumper bar to be moved from the raised position to the lowered position.

3. A road vehicle according to Claim 1 or Claim 2, wherein stop means are mounted on the vehicle so as to abut the bumper bar when the support means and bumper bar are in the raised position.

4. A road vehicle according to Claim 3, wherein wedge means are mounted on the bumper bar which abuts said stop means for wedging engagement with said stop means when the support means and bumper bar are in the raised position.

5. A road vehicle according to any of the preceding claims, wherein a second bumper bar is provided between the level of the first bumper bar and the level of the pivot means.

6. A road vehicle according to Claim 5 wherein the second bumper bar is secured to the support means.

7. A road vehicle according to Claim 5, wherein the second bumper bar is a fixed bumper bar secured to the vehicle frame between the floor level of the vehicle and the level of the pivot means.

8. A road vehicle according to any one of Claims 5, 6 or 7 wherein the bumper bars are provided in substantially parallel relationship.

9. A road vehicle substantially as hereinbefore described with reference to the accompanying drawings.

ALLAM & TREGEAR,
Chartered Patent Agents,
2 & 3 Norfolk Street, Strand,
London, W.C.2.
Agents for the Applicants.

Leamington Spa: Printed for Her Majesty's Stationery Office, by the Courier Press (Leamington) Ltd.—1965. Published by The Patent Office, 25 Southampton Buildings, London, W.C.2, from which copies may be obtained.

Fig-1

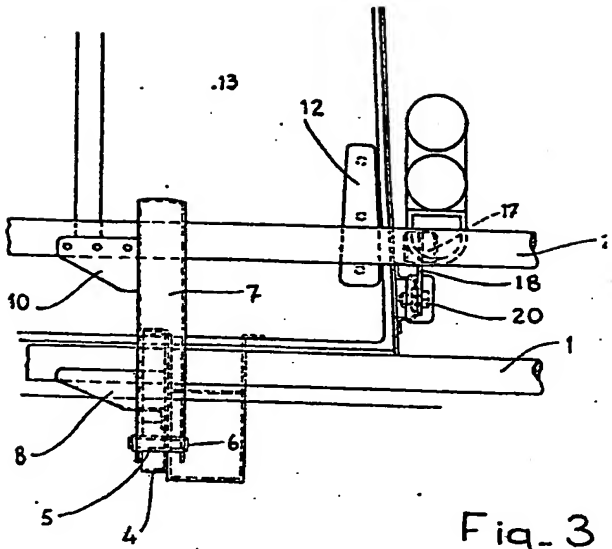
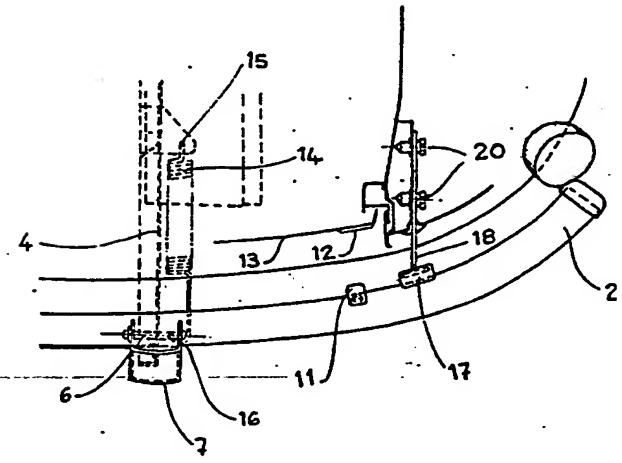
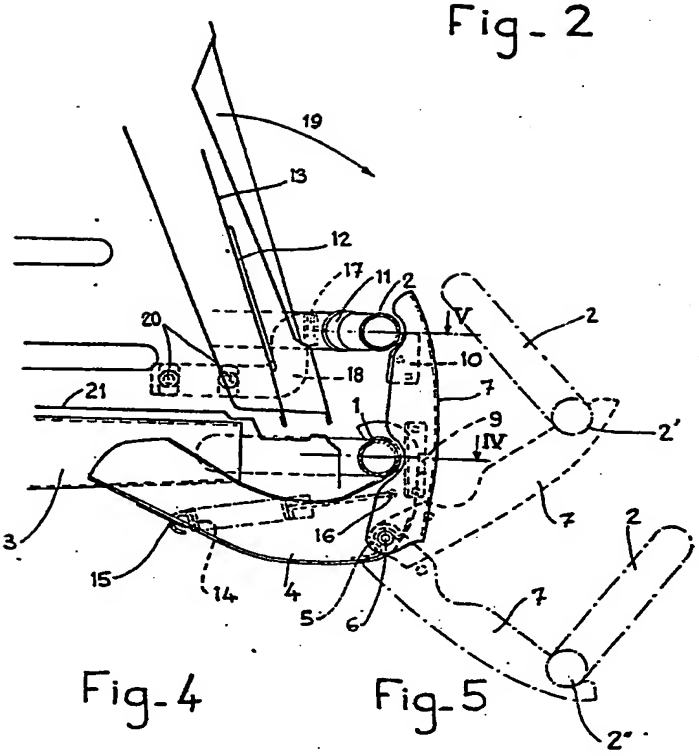


Fig-3



987996 COMPLETE SPECIFICATION
4 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheets 1 & 2

Fig. 2



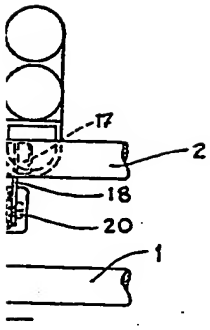


Fig. 3

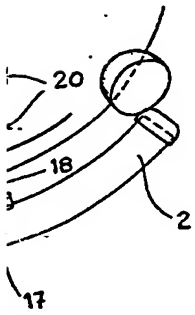


Fig. 4

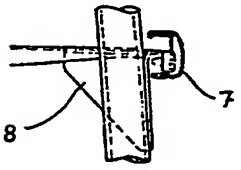
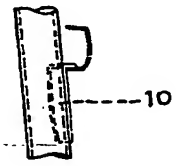


Fig. 5



987996 COMPLETE SPECIFICATION
4 SHEETS This drawing is a reproduction of the Original on a reduced scale
Sheets 1 & 2

Fig.1

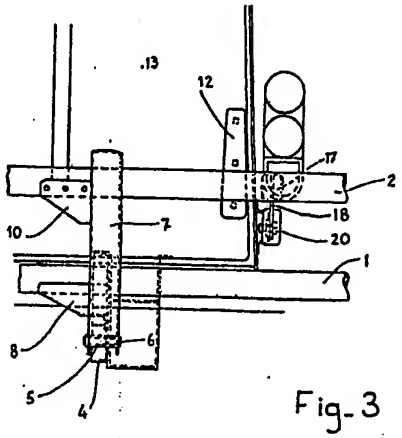


Fig.2

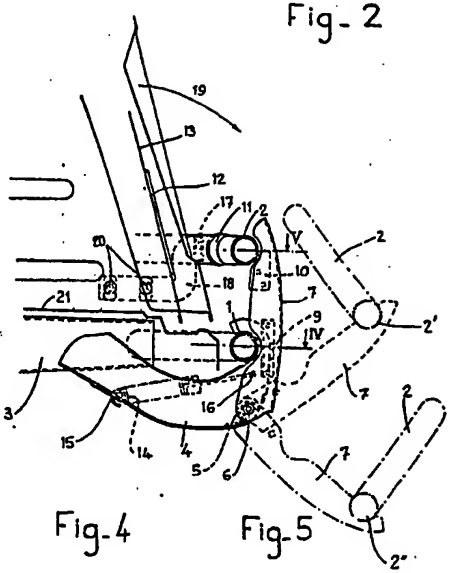


Fig.3

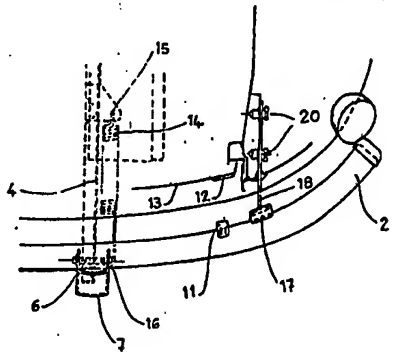


Fig.4

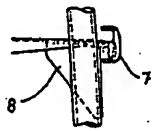


Fig.5

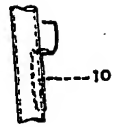


Fig.6

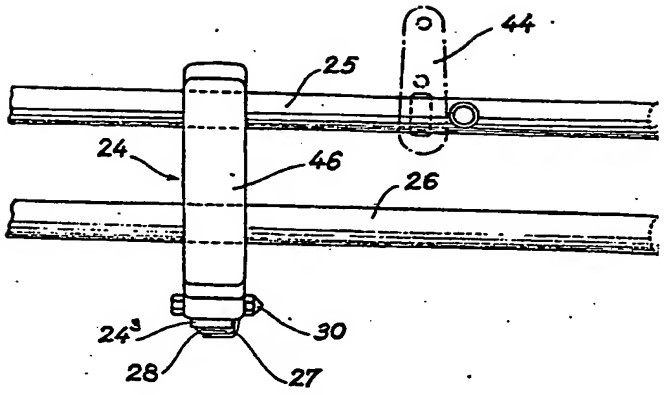
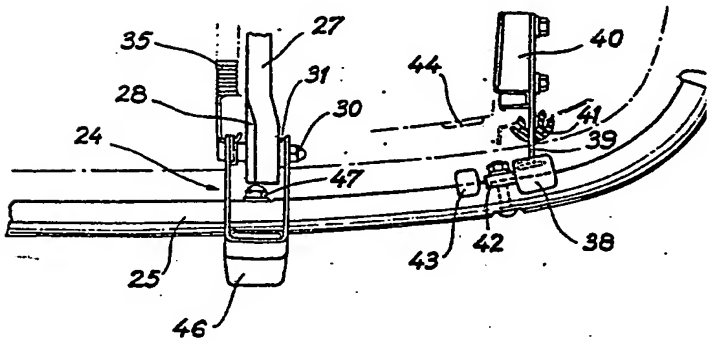

44
25
24
46
26
24
30
28
27

Fig.7


35
27
40
44
31
28
30
41
24
39
47
43
42
38
25
46

987996 COMPLETE SPECIFICATION
4 SHEETS *This drawing is a reproduction of the Original on a reduced scale*
Sheets 3 & 4

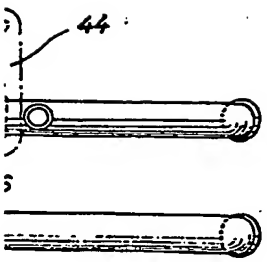


Fig.8

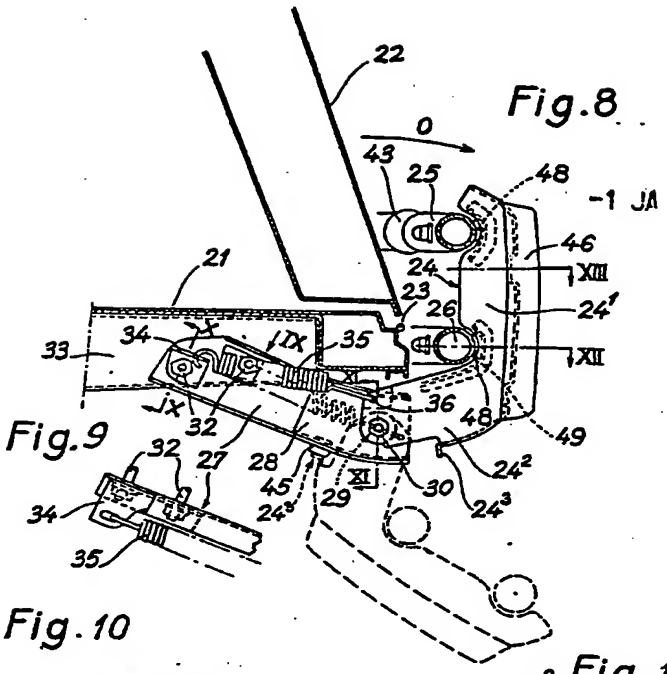


Fig.9

Fig.10

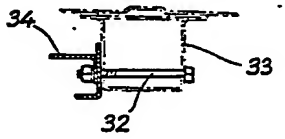
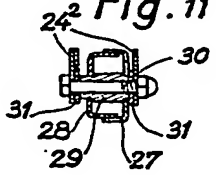


Fig.11



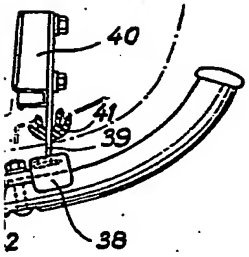


Fig.12

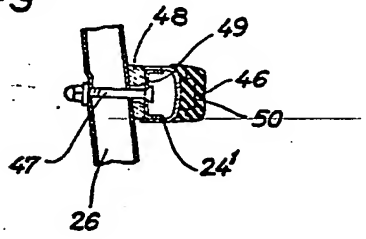
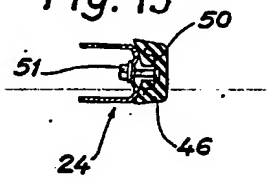


Fig.13



987996 COMPLETE SPECIFICATION
4 SHEETS This drawing is a reproduction of the Original on a reduced scale
Sheets 3 & 4

Fig.6

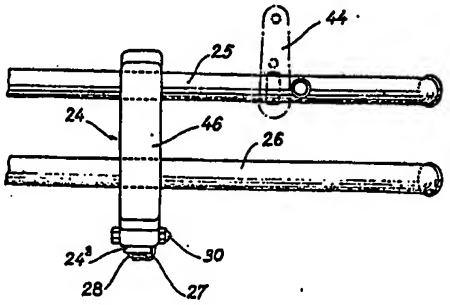


Fig.7

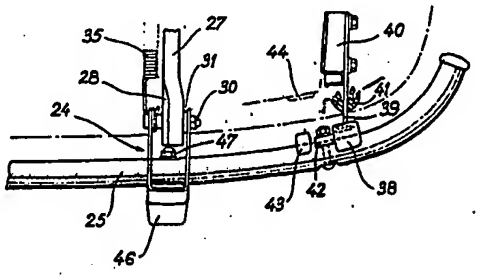


Fig.8

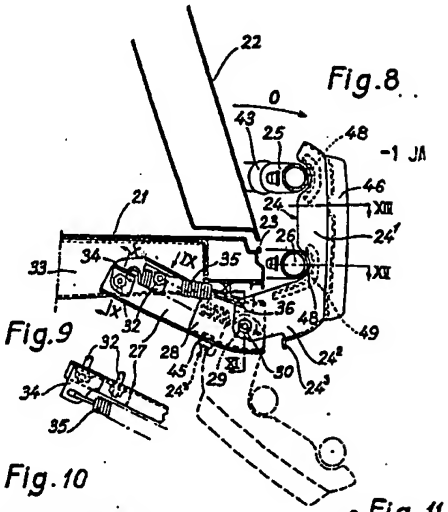


Fig.9

Fig.10

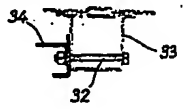


Fig.11

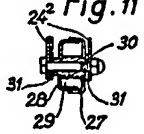


Fig.12

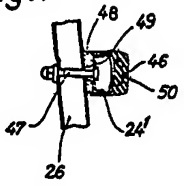


Fig.13